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ABSTRACT

The Classroom Behavior Description (CBD)--a brief 10-item checklist on which teachers rate preschool childrens' behaviors which are considered most likely to influence school performance--was developed on the basis of earlier extensive research with more comprehensive children's behavior inventories. Results are reported of studies of teachers' ratings of 360 children, ages 2 to 6, in Head Start, Right-to-Read, day care programs, and in a school for mentally retarded youth. Impressive correlations were obtained between CBD ratings, cognitive measures, and other behavior ratings. Five years later, CBD ratings of a sample of Head Start children correlated reasonably well with third grade mental ability test and achievement test scores, and with placement in special remedial classes. Results should be of interest to preschool educators seeking a simple and inexpensive method to help identify children who can profit from early prescriptive intervention to improve cognitive development and scholastic achievement. (Author/GDC)

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TITLE: USE OF THE CLASSROOM BEHAVIOR DESCRIPTION CHECKLIST IN PRESCHOOL DEVELOPMENTAL SCREENING

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ABSTRACT

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The Classroom Behavior Description (CBD) is a brief 10-item checklist on which to obtain teachers' ratings of those preschool children's behaviors which are considered most likely to influence school performance. It was developed on the basis of earlier extensive research with more comprehensive children's behavior inventories. Reported here are results of studies of teachers' ratings of 360 children, ages 2 to 6, in Head Start, Right-to-Read, day care programs, and in a school for mentally retarded youth. Impressive correlations were obtained between CBD ratings, cognitive measures, and other behavior ratings. Five years later, CBD ratings of a sample of Head Start children correlated reasonably well with third grade mental ability test and achievement test scores and with placement in special remedial classes.

Results should interest preschool educators seeking a simple and inexpensive method to help identify children who can profit from early prescriptive intervention to improve cognitive development, scholastic achievement, and behaviors which influence scholastic performance.

USE OF THE CLASSROOM BEHAVIOR DESCRIPTION CHECKLIST IN PRESCHOOL DEVELOPMENTAL SCREENING

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The Classroom Behavior Description (CBD) is a very brief (10-item) preschool checklist on which a teacher describes her judgment of the child's ability, classroom adjustment and several social, emotional, and task-oriented characteristics considered likely to influence classroom competence. For our purposes here we define classroom competence as the ability of children to function in a structured educational environment.

The CBD was initially developed as a companion measure to the Preschool Preposition Test (PPT) to explore the relationship of social skills to cognitive ability (Aaronson & Phillips, 1977; Aaronson, Phillips, Bertolucci & Aaronson, 1978; Aaronson & Schaefer, 1968, 1971, 1977, and Note 1). We devote a full report to the CBD here because it has performed beyond our expectations in identifying behaviors associated with classroom competence and in predicting cognitive abilities, school achievement, and special education placement five years later at the third-grade level. The predictions were the result of a longitudinal study of children tested and rated on the CBD when they were in a Head Start program.

Teachers' ratings of children's classroom behavior have long been considered useful and have been widely employed, particularly with younger children who have not yet developed the social facades that complicate the interpretation of behavior (Anastasi, 1976, p. 607). With the advent of Head Start and similar preschool programs, whose objectives include the

prevention and amelioration of developmental delay, teachers' ratings have increased in importance. There is general recognition today that certain social skills are a necessary basis for the teacher-pupil instructional experience as well as the overall school success of the individual student (Cartledge & Milburn, 1978). Based on teachers' observations, many researchers have identified specific facets of classroom behavior as positively related to the child's classroom success. These facets include attentive and task-oriented behaviors, verbal interaction, self-control, self-management, cooperation, and compliance (Bryan, 1974; Cartledge & Milburn, 1978; Cobb, 1972; Dunn & Kowitz, 1970; Feldhusen, Thurston & Benning, 1967, 1970; Gibson & Levin, 1975; Hops & Cobb, 1974; Lahaderne, 1968; Perkins, 1965).

Indeed, the teacher's perceptions of the student's behaviors, which are reflected in the ratings, might in themselves influence the student's performance. Efforts to establish a causal relationship have yielded contradictory results. A study by Luce & Hoge (1978) investigating the relations among Teacher Rankings, Pupil-Teacher Interactions, and Academic Achievement failed to find a teacher expectancy effect operating as a determinant of achievement among five classes of third and fourth grade students. Other researchers have also failed to establish links between expectancies and behavior (Alpert, 1974; Garner & Bing, 1973; Jose & Cody, 1971). However, some studies (Brophy & Good, 1970; Good, 1970; Good, et al., 1973; Rist, 1970) have found the level of pupil activity in the classroom, frequency of pupil-teacher interactions, and frequency of praise to be among behaviors which are related to teacher expectancy. Perhaps a certain degree of reciprocity exists between the teacher's perception of the student's behavior and the

student's performance. While the teacher's expectations may tend to influence the child's performance, these expectations may be realistically based on manifestations of the child's pro-social behaviors and mental abilities.

No matter how one interprets the dynamics underlying the teachers' classroom behavior ratings, there is agreement that they provide useful information that can be employed to the benefit of the young student. Schaefer and Aaronson (1977) state that controversy between proponents of promoting the social and emotional development of children and proponents of promoting their cognitive development is unnecessary, for an optimal education program can and should promote both adjustment and competence. Kohlberg (1968) too, warns against dichotomizing socio-emotional and cognitive development. Many others see social skills as closely related to classroom competence and suggest methods of improving children's social skills (Baldwin & Baldwin, 1970; Harris, Wolf & Baer, 1967; Ionotti, 1978; O'Connor, 1972; Shantz, 1975; Smilansky, 1968; Spivack & Shure, 1974). For example, Cartledge and Milburn (1978) make a strong case for the modifiability of negative behaviors through modeling, contingent and token reinforcement, and like methods. Wittrock (1979) goes a step further and suggests that students who are not attentive and who lack motivation to learn can be trained to internalize responsibility for learning. He cites a study by deCharms (1976) in which academic achievement, especially in language skills and arithmetic, was directly related to such training. Before ameliorative and compensatory programs can take place, however, one would need to screen students' competence-related behaviors to identify the students who require special assistance. The CBD shows promise of fulfilling such a need.

The development of the CBD was based on a series of comprehensive and detailed classroom and home behavior inventories in which many discrete observable behaviors were rated (Aaronson & Schaefer, Note 3; Schaefer, 1961, 1971a, 1971b, 1975, 1976; Schaefer & Aaronson, 1972, 1973, 1977, Notes 4 to 11; Schaefer, Aaronson & Burgoon, 1971, and Note 12; Schaefer, Aaronson & Small, 1973; Schaefer, Droppleman & Kalverboer, 1965). The relationship between earlier classroom behavior inventories and the CBD is explained more fully in the results and discussion section.

The CBD can be used in one of two ways; (1) in conjunction with mental ability and achievement tests and (2) in the absence of other evaluation tools, to provide a measure of classroom behaviors related to competence and school performance. Used either way, the CBD can yield valuable information in a simple and inexpensive way to help identify children who might profit from early intervention to improve their social skills and scholastic achievement.

METHOD

Procedure

To complete the CBD, the teacher describes the behavior of the child from personal observation and experience, without discussion with others, on a ten-item checklist by circling one of four behavioral ratings: Very Much Like, Somewhat Like, Very Little Like, Not at All Like. Six of the items refer to positive behavior traits and four to negative ones. After the 10 items are rated, the teacher rates the child's classroom adjustment, again in four gradations: Well Adjusted, Fairly Well Adjusted, Has Some Behavior Difficulties, Has Many Behavior Difficulties. The CBD checklist is presented in Table 1.

Subjects

Reported here are the data from 571 CBDs collected on 360 children, 286 of whom were normal children ages two to five years. An additional 74 children attended a public school for mentally retarded (MR); they were five to 17 years old, with mental ages of from two to six years, as measured on the Peabody Picture Vocabulary Test (PPVT). The samples, described in Table 2, represent racially mixed populations, both lower and middle-class, from urban, suburban and rural areas in four different States: Maryland, North Carolina, New York, and Utah. The five separate samples listed in Table 2 actually represent only four projects. We have shown the Maryland sample of 118 children as two different samples, with 81 and 37 subjects respectively, for clarity in reporting. The 37 subjects were a special subgroup which was studied in greater depth. The two Maryland samples were combined in the third grade follow-up study.

Measures

We took the most direct approach to discovering whether the CBD behavior items were describing characteristics related to classroom competence. We obtained scores on students' tests of cognitive abilities along with the CBD ratings (Table 2). We could then study statistically the relationships between the CBD ratings and recognized measures of cognitive ability. We also compared the results of the CBD ratings with those of a different set of behavior ratings describing children's behavior during the testing sessions.

The measures that were obtained and analyzed along with the CBD ratings were the PPT, PPVT, Boehm Test of Basic Concepts, and the Bayley Test Behavior Items. Not every child received every measure. For the Maryland special subgroup and the Utah MR children, two separate ratings were obtained, one set in the Fall near the beginning of the school year and the other in the Spring seven months later, toward the close of school. We shall refer to

them as pre- and post-tests. Additionally, in the Maryland follow-up study, the preschool CBD ratings were compared with scores on the Cognitive Abilities Test (CAT) and the Iowa Tests of Basic Skills (ITBS) administered near the close of the third grade. To facilitate analyses, the teachers' rating of the child's classroom adjustment is treated as an eleventh CBD item throughout this report.

RESULTS AND DISCUSSION

Age and Sex-Related Criteria

Do competence-related social skills improve with increasing age along with mental abilities? Is there a difference in classroom behavior of boys and of girls in the early years? To shed light on these questions, we examined, for the normal samples, scores on the individual CBD items in six-month age groupings from 24 to 59 months (Table 3). Across the four normal samples for both sexes together, the positive traits, Attentive and Persevering, Self-Reliant and Self-Sufficient, and Conforming and Obedient improved significantly with increasing age. At the same time ratings of the negative traits, Dependent, Wants Help Constantly, and Distractible and Hyperactive, significantly decreased. The remaining traits had a tendency to move in a socially accepted direction. The improvement no doubt reflects both increasing maturity and group experience in the classroom.

We then examined the CBD items, with age covaried, separately for girls (N=147) and for boys (N=139), (Table 4). The girls show higher ratings than the boys on all six pro-social behaviors. The girls are rated significantly more Well-Adjusted, and Able in Comprehension and Problem-Solving. In contrast the boys have stronger ratings on negative behaviors. They are rated significantly more Belligerent and Irritable, Distractible and Hyperactive, and somewhat more Dependent, Wants Help Constantly. Ratings of Gregarious and Verbally Expressive, and of Withdrawn and Solitary were about the same for both sexes. These behaviors can both be presumed to be related to extraversion-introversion.

To sum up our age and sex related findings, when behaviors are examined for both sexes together, preschool children's behaviors tend to become more socially acceptable with increasing age. When the behaviors are examined separately by sex, female teachers rate girls as having better social skills, greater competence and better classroom adjustment than boys. It is not clear whether teachers' ratings are influenced in favor of girls or whether differences in behavior are in fact sex-related.[1]

Validity and Reliability of the CBD

Comparison of the CBD with earlier Classroom Behavior Inventories. Correlations between a new test and similar earlier ones can be cited as evidence that the new test measures approximately the same general area of behavior (Anastasia, 1976). The development of the CBD was based on an effort to replicate, with a brief and simple adjective checklist, the factor structure obtained and repeatedly replicated by Schaefer and associates with a series of more comprehensive Classroom Behavior Inventories, which will be referred to as CBIs (Schaefer, 1961; Schaefer, 1971a; Schaefer, 1976; Schaefer & Aaronson, 1973; Schaefer, Aaronson & Burgoon, Note 12; Schaefer, Droppleman & Kalverboer, 1965.) Following preliminary research in the Netherlands (Schaefer, Droppleman & Kalverboer, 1965), Schaefer and his associates developed an American classroom behavior inventory investigating a broad range of behaviors. That earlier American inventory included 64 behavior traits, or scales, each further defined by a set of five items based on discrete observable classroom behaviors, 320 items in all (Schaefer, Aaronson & Burgoon, Note 12). Scale reliability estimated by Kuder-Richardson formula 20 ranged from .73 to .96 with a median of .86 for ratings of 153 male and female seventh-graders in integrated schools. The first three factors that were extracted from factor analyses of the items (varimax rotation)

[1] Analysis of age and sex-related criteria for the MR sample will be presented in another paper.

described major dimensions labelled Extraversion versus Introversion, Task Oriented Behavior, and Hostility. The stability of the factor loadings in both the Netherlands and the American inventory led to the development by Schaefer and Aaronson of briefer versions for other age groups and other situations. Among them are briefer versions of the original American CBI, an Infant Behavior Inventory, a Day Care Behavior Inventory and a Home Behavior Inventory (Schaefer & Aaronson, 1973). Many CBIs had been factor-analyzed for large samples of children and had repeatedly replicated the original three factors.

Through a series of refinements effected through the development of an 18-item version of the CBI (Schaefer, 1975), and a 12-item version (Schaefer & Aaronson, 1973), interpretation of the factor loadings was extended to include bipolar loadings on the Task-Oriented and Hostility factors in place of the unipolar loadings identified above. Finally, six paired adjectives directly describing the three bipolar factors were developed for the present version of the CBD as follows:

Factor I. Positive Task-Oriented Behavior vs. Negative Task-Oriented Behavior, described by Attentive & Persevering vs. Distractible & Hyperactive.

Factor II. Positive Social Behavior vs. Social Hostility, described by Considerate & Kind vs. Belligerent & Irritable.

Factor III. Extraversion vs. Introversion, described by Gregarious & Verbally Expressive vs. Withdrawn & Solitary.

To the six above items were added items describing Independence, Dependence, and Conformity, based on their relatively high factor loadings related to classroom competence. A general ability item and a global rating of classroom adjustment complete the brief checklist.

To help investigate the validity of the CBD, we factor analyzed (varimax rotation) the data in our samples for the six CBD items derived from the three CBI bipolar factors. We found that the factor loadings of the CBD items were able to replicate those of the CBI from which they were derived (Table 5). As we pointed out earlier, the CBIs have several items representing a single behavior trait whereas the CBD has only one. In order to represent the comparison in Table 5, we averaged the factor loadings for the appropriate several items in the CBI. Therefore, each of the CBI figures in the table actually represents the mean factor loading of from two to six items. By inspection it can be seen that the six CBD items do a creditable job of replicating the three CBI bipolar factors. The averaged factor loadings on the CBIs have somewhat higher values. For example, CBI loadings on Hostility range from -.82 to -.92 compared with CBD -.69 to -.86; CBI loadings on Task Oriented range from .79 to .91 compared with CBD .49 to .86; and CBI loadings on Extraversion range from .74 to .91 compared to CBD .68 to .89. However, the values of CBD factor loadings remain sufficiently impressive to warrant the use of the CBD as a rapid behavior screening device when lack of teacher time or inclination precludes the use of a more comprehensive classroom behavior inventory.

Comparison of CBD with Bayley Test Behavior Items. To further investigate the validity of the CBD items, we examined the correlations between the ratings of CBD competence-related items and four comparable test behavior items on the Bayley Infant Behavior Record (1969), Table 6. The Bayley ratings were obtained for a North Carolina sample of 98 two to three-year-old children, within a few days of their being rated on the CBD. The four Bayley items selected for analysis were Goal Directedness, Attention Span, Object Orientation, and Cooperativeness. All of the positive CBD behavior traits correlate significantly with the four Bayley items ($p < .005$). Four of the

behaviors, Well-Adjusted, Able, Attentive and Persevering, and Self-Reliant and Self-Sufficient, reached values from .41 to .75. Distractible and Hyperactive had the highest negative correlations with the Bayley items (-.64 to -.78, $p < .005$).

Test-Retest Reliability of CBD Behavior Ratings. Two of our samples, the Maryland subgroup (N=37) and the MR sample (N=74) had collected CBD ratings near the start and again toward the close of the school year, the same teacher rating the child on both occasions. We examined our data on these samples for evidence of test-retest reliability for the CBD items. Ideally, retest for very young children should be administered after a relatively short interval, a few days to a few weeks. Correlations can be expected to decrease progressively as the interval lengthens due to intervening experiences and progressive developmental changes (Anastasia, 1976). As our samples were retested seven months later, only moderate evidence of test reliability was to be expected. We examined the data in two ways: (1) for similarities, by inspecting the correlations between the two sets of ratings (Table 7), and (2) for differences, by inspecting the results of a Hotelling's T^2 Test (Table 8). Both methods yielded creditable results for the time span involved.

For both groups, correlations between early and later CBD ratings yielded moderate values (mostly .50s and .60s, $p < .001$). Examining the data for differences in mean scores between the two ratings (Table 8), we find greater stability of behavior over time for the Maryland children than the MRs. Mean differences in behavior ratings for the Maryland group were negligible, none reaching significance. However, children were rated somewhat more Gregarious and Verbally Expressive, and Belligerent and Irritable, toward the close of the school year. One might speculate that either teachers' judgments on these two dimensions varied after observing the children for a longer period of time or that the children became less inhibited in their behavior toward the end of the school year. Ratings for

the MRs showed a general tendency toward worsening behavior, significant decrements occurring in Adjustment, Belligerent and Irritable, and Dependent, Wants Help Constantly.

CBD Ratings and Later School Progress. As will be more fully described in a later section of this paper, many of the CBD items correlated substantially with achievement test and mental ability test scores five years later in a follow-up study conducted with the Maryland samples (Tables 12, 13, 14). Among the children in the study, those who had been placed in Special Education classes had significantly poorer social skills than the others as rated on the CBD by their Head Start teachers years earlier (Table 15). We note this here as an indication of predictive validity of the CBD items for academic competence.

CBD Item Analysis

(a) General Patterns in the CBD Intercorrelation Matrix.

To observe the relationships among the 11 CBD items, we examined the intercorrelation matrix of every item with every other item. This was done separately for the 286 normal subjects (Table 9) and for the 74 mentally retarded subjects (Table 10).

Both groups showed a cluster of 7 prosocial behaviors that correlated positively with each other, and a second cluster of 4 antisocial behaviors that correlated positively with each other. The prosocial cluster includes the items: Well Adjusted; Able in Comprehension & Problem Solving; Attentive & Persevering; Self-Reliant & Self-Sufficient; Conforming & Obedient; Considerate & Kind; Gregarious & Verbally Expressive (Items 1-7 in Tables 9, 10). The antisocial cluster includes the items: Belligerant & Irritable; Withdrawn & Solitary; Dependent, Wants Help Constantly; Distractible & Hyperactive (Items 8-11 in Table 9, 10).

Both normal and mentally retarded subjects showed higher positive intercorrelations within the prosocial cluster: averaging r=.40 for the normals and r=.33 for the MRs. For the anti-social cluster, the intercorrelation values were about half as large for each group, r(normals)=.23, r(MR)=.17. Finally, both groups showed negative correlations among items between the pro- and antisocial clusters. The magnitude of these between-cluster correlations were about half-way between the magnitudes for the pro- and antisocial within-cluster values (r(normals)=-.33, r(MR)=-.23. The fact that the correlational clusters are about twice as strong for prosocial items as for antisocial items can be interpreted meaningfully in terms of individual children in the classroom. A child who shows one prosocial behavior is quite likely to show several others. In contrast, a child who shows one antisocial behavior is not so likely to display the other antisocial behaviors.

(b) CBD Items and Classroom Competence.

At the start of this paper we proposed that the CBD could serve as an indicator of classroom competence, defined as the child's ability to function in a structured educational environment. The relationships among the CBD items provide support for that proposal in several ways.

(1) Correlations of Individual Items with the CBD as a Whole. The pattern of correlations for individual items with the CBD as a whole appears to be in line with general information about the social and educational functioning of the classroom and about teachers' expectations of the children. To obtain the correlation of each given item with the CBD as a whole, we averaged the absolute magnitudes of its pairwise correlations

with all other items (based on the r-values in Tables 9 and 10). We will refer to these as "overall" correlations. In general the prosocial items correlate most highly with the CBD as a whole while the antisocial items correlate less well. This pattern is stronger for the normals than for the MRs. If we average the rank orderings of the "overall" correlations for these two samples, the top 4 items in order are: Attentive, Well Adjusted, Able, and Conforming - all prosocial items. Such prosocial behaviors characterize the "Ideal Child" in terms of classroom competence. The "Able" and "Well-Adjusted" child will be likely to optimize his own educational experience. In addition, the "Attentive" and "Conforming" child will generally facilitate the functioning of the classroom as an educational environment, from the viewpoint of the teacher in managing the class as a cohesive unit.

(2) Relations of "Overall" Item Correlations to the Factor Analysis. The obtained rank ordering of the "Overall" correlations will in turn order the 3 bipolar factors in terms of their importance for classroom competence. CBD items representing Task-Oriented Behaviors (i.e., Attentive, Distractible) rank the highest, those representing Social Behaviors (i.e., Considerate, Belligerant) rank next, and those representing Extraversion-Introversion (i.e., Gregarious, Withdrawn) rank lowest. This ordering holds for both the normal and the MR populations. The respective positive poles (Attentive, Considerate, Gregarious) have rank orders 1, 6 and 10 for normals, and 2, 8 and 10 for MRs. The respective negative poles

(Distractible, Belligerant, Withdrawn) have rank orders 7, 9 and 11 for normals and 3, 5 and 11 for MRs.

It is instructive to note the differences in rank orderings between the normals and MRs for the first two factors. (Ranks for the third factor were equal.) The normals show higher ranks than the MRs for the positive poles: 1, 6 vs. 2, 8. But they show lower ranks than the MRs for the negative poles: 7, 9 vs. 3, 5. That is, prosocial items correlate better with the CBD as a whole for normals than for MRs. In contrast, antisocial items correlate (negatively) better with the CBD as a whole for MRs than for normals. This contrast points out the sensitivity of the CBD to individual differences in classroom competence. These CBD items stack up as one might expect in terms of the specific behavior characteristics or traits for these rather different populations of children.

(3) Consistency of CBD ratings across populations. The CBD as an indicator of the child's ability to function in a structured educational environment shows strong consistencies across different populations. Although CBD items are sensitive to individual population differences, they also show striking similarities, regardless of the population. As noted above, the pattern of clustering for pro- and antisocial items was similar for normals and MRs. We also saw that the "overall" correlations for CBD items rank ordered the 3 bipolar factors as contributors to classroom competence in the same way for both populations.

Finally, we obtained a direct comparison of the item analyses between normals and MRs. For the normals and the MRs, we compared the cell-by-cell pairwise correlations from the item-analysis intercorrelation matrices. To do this, we obtained a Pearson correlation for normals vs. MRs using the cell r-values as data. The item analyses for these two populations correlate well with each other, yielding a Pearson r of .87 ($p < .001$). Corroborating this result, the "overall" correlations for normals vs. MRs yielded a Spearman r of .67. These strong similarities for item clusters, for factor orderings and for pairwise intercorrelations for the two vastly different populations attest to the consistency and reliability of the CBD as an indicator of the underlying theoretical construct of classroom competence.

CBD Ratings and Cognitive Ability. The teachers' CBD ratings of the children in our normal samples have been compared with their scores on cognitive tests as an independent measure of competence. Demonstration of such criterion-related validity of the CBD ratings should support our claim that the CBD is an indicator of classroom competence. Some of the children in our samples were tested with the PPT, the PPVT (Dunn, 1965) and the Boehm Test of Basic Concepts (Boehm, 1971) at the time of their CBD ratings.

Figure 1 contains a graph of the correlations between the CBD ratings and PPT and PPVT mental test scores for 116 children from three of the normal samples. As can be noted, the prosocial behaviors all have positive correlations and the antisocial behaviors have negative correlations, the scores for the two cognitive tests differing very little from one another in their correlations with the CBD. Upon closer inspection it can be seen that the CBD Ability item

has the highest correlation, followed by Attentive and Persevering, and Self-Reliant and Self-Sufficient. The individual correlations of the CBD items with the PPT and the PPVT, most of which reached significance ($p < .005$) can be observed in Table 11.

A relatively small number of children (N=35) were administered the Boehm Test of Basic Concepts (1971) at the time the CBD forms were filled out by their teachers. As with the PPT and the PPVT, the prosocial behavior ratings all had positive correlations and the antisocial ones had negative correlations with the CBD ratings. As with the other two tests, the Ability rating had the highest correlation with the Boehm test scores. The CBD-Boehm correlation coefficients, six of which reached moderate values (.36 to .58) fall short of reaching statistical significance, possibly due to the small size of the sample.

Predictive Validity of the CBD

CBD Correlations with Cognitive and Achievement Test Scores. The CBD items were able to predict many of the outcomes of scores on the Cognitive Abilities Test (CAT) (Thorndike & Hagen, 1971), and the Iowa Tests of Basic Skills (ITBS) (Hieronymus & Lindquist, 1971), tests which were administered five years later when some of the children in our preschool samples reached third grade. Conclusions that emerge from longitudinal studies are that preschool mental tests can have moderate validity in predicting subsequent intelligence test performance (Anastasia, 1976). However, we have found no studies in which teachers' ratings of social skills in relation to classroom competence have demonstrated predictive validity of cognitive and achievement test performance over a span as long as five years. Our third grade follow-up data have motivated us to report the results of the use of the CBD.

Two of our samples, together forming a group of 118 children, were initially rated by their teachers on the CBD when they were in a Maryland school-administered Head Start program. The entire group was also tested on the PPT, and a special subgroup of 37 was tested on the PPVT. A computer search identified 54 children as remaining in the school system at the completion of the third grade, at which time the CAT and the ITBS were administered. Third grade test scores were obtained on from 40 to 44 children and are compared with their early CBD scores both as a group and separately by sex. Ten of the children were not included in the third grade testing by policy because they were in Special Education classes. We compared the early CBD ratings of these Special Education children with those of the third graders on whom we were able to obtain test scores.

Table 12 lists correlations of the Head Start CBD ratings, PPT, and PPVT scores with third grade CAT and ITBS scores. The CAT has three subtest scores, Verbal, Quantitative, and Non-Verbal, but yields no total score. The ITBS provides five subtest scores, scores for parts of subtests, and a composite score for the entire test.

(a) General Patterns of CBD Correlations. The correlations of individual CBD items with later achievement test scores (Table 12) are consistent in many respects with patterns obtained for the CBD item analysis in the preceding section. First, the prosocial CBD items (1-7) show positive predictive correlations with the CAT and ITBS items, while the antisocial CBD items (8-11) show negative predictive correlations. Second, the prosocial cluster as a whole shows higher absolute correlational values than the antisocial cluster: Mean r(prosocial)=+.31, mean r(antisocial)= -.18.

To index the predictive power of individual CBD items, we first averaged the correlations for each given CBD item across the ITBS items within each subtest. We then ranked the 11 CBD items in terms of their predictive strength for the CAT subtests and each of the ITBS subtests. There was high agreement of rank orderings for the 11 CBD items, regardless of the particular subtest. Surprisingly, the best single item predictor (rank 1) was Conforming & Obedient. Our educational system appears to reward students who conform to the system.

Next, we considered the predictive correlations for the 3 pairs of bipolar factors. The predictive correlations for the positive poles showed the same relative ordering as we saw for the item analysis, when we considered the relations between individual items and the CBD as a whole. Namely, the Task Oriented item was highest (Attentive = predictive rank 2), the Social Behavior item ranked next (Considerate = predictive rank 3) and the Extroversion item rated lowest (Gregarious = predictive rank 7). For each of these factors the predictive correlations for the negative pole ranked lower than its positive partner, but the 3 negative poles did not show the analogous relative ordering. Within the set of negative poles, the Task Oriented item ranked in the middle (Distractible = predictive rank 8) and the Social Behavior item ranked highest (Belligerant = predictive rank 6). The Introversion item ranked lowest (Withdrawn = predictive rank 9).

A counter-intuitive result of this analysis was that two seemingly central performance items, "Able in Comprehension and Problem Solving" and "Well Adjusted" only ranked 4th and 5th respectively

in predictive power. Those items had ranked 2 and 3 in their "overall" correlation with the CBD as a whole. However, this lower ranking fits in with a general pattern shown in the predictive analysis. If we view the educational process as an interaction between the child and the classroom environment, we might subjectively classify the various CBD items into child-centered and environment-centered behaviors although this is an orientation rather than a dichotomy. We might then compare the rank-orderings of CBD items in terms of their predictive correlations to their initial rank orders for the "overall" (i.e., concurrent) correlations. The environment-centered items move up in the ranking and the child-centered items move down. For this analysis, we consider only data for normals, as we have no predictive correlations for mentally retarded.

We have subjectively classified 5 of the 11 CBD items as environment-centered and 6 as child-centered as indicated below. Of these, 9 out of 11 moved in the hypothesized directions. In our discussion, lower numbers indicate higher rank orderings. For example, rank 1 represents the largest or strongest correlational value in absolute magnitude. Rank 11 represents the smallest correlational value, i.e., independence from other items in the item analysis, or no predictive value for CAT and ITBS scores. For the 5 environment-centered items, 4 moved up in the ranking as we go from (a) the initial concurrent item analysis to (b) the predictive analysis: Conforming & Obedient moved up from 5 to 1 (i.e., the best predictor); Considerate moved up from 6 to 3; Gregarious moved up from 10 to 7; and Belligerent moved up from 9 to 6. Dependent, Wants Help Constantly contradicts our hypothesis by moving down from 8 to 11.

For the 6 child-centered items, 5 moved down in the ranking from concurrent item analysis to prediction: Attentive & Persevering moved down from 1 to 2; Able in Comprehension moved down from 2 to 4; Well-Adjusted moved down from 3 to 5; Distractible moved down from 7 to 8, and Self-Reliant moved down from 4 to 10. Contradicting the hypothesis, Withdrawn & Solitary moved up from 11 to 9. Although the reader may disagree with our classification of one or another item, the overall pattern is striking. The best predictors of academic achievement are environment-centered: whether or not the child conforms to the system and whether or not he/she is considerate of others, including the teacher. Child-centered variables such as Persevering, Self-Reliant, and Able in Comprehension & Problem Solving have somewhat reduced predictive power relative to their initial standing in the CBD item analysis.

(b) Sex Differences in CBD Predictions. We obtained the predictive correlations of CBD items for the CAT and ITBS achievement tests separately for boys and girls (Tables 13 & 14). The general trends were replicated for both sexes. For example, for each sex separately, the prosocial CBD cluster yields positive correlations, the antisocial cluster yields negative correlations, and the prosocial cluster yields larger r-values than the antisocial cluster.

On a more detailed examination we see two types of differences between sexes. First, the CBD items have higher predictive correlations for girls than for boys; this is the case for 14 out of 15 scores on the CAT and the ITBS. If one examines the individual cell values in Tables 13 and 14, for boys 13 cells have correlations of opposite sign to the positive or negative predictions of the given CBD item as a whole, and some of these values have substantial

magnitude. Such reversals are rare for girls.

A second sex-related difference lies in the qualitative patterns of cognitive achievement predicted for the two sexes. Some of the past literature on cognitive development suggests that girls do better on verbal tasks and boys do better on quantitative-spatial tasks. The CBD predictions for CAT & ITBS are consistent with such findings. To assess these patterns, we averaged over the 11 CBD items in Tables 13 & 14 to get a single CBD value for each of the 15 CAT and ITBS items. On the CAT, mean CBD correlations for the girls were higher on the verbal item (r=.38) than on the quantitative (r=.29) or the non-verbal item (r=.36). For the boys, the opposite relation held. Their mean CBD correlation for the CAT verbal item (r=.18) was lower than those for the quantitative (r=.22) or the non-verbal (r=.27) items. For the ITBS we averaged the correlations for vocabulary and the language skills to yield a verbal score, and we averaged the correlations for math skills and work-study skills (e.g., graphs, maps) to yield a quantitative-spatial score. For girls the verbal score (r=.41) exceeds the quantitative-spatial score (r=.34), but for boys the reverse is true: verbal r=.23, quantitative-spatial r=.26. For the ITBS we deleted the reading comprehension item from this qualitative analysis as the comprehensional aspects reflect both verbal and spatial organization skills (Miller & Johnson-Laird, 1976). It is instructive to note, however, that of all the ITBS items, reading comprehension has the highest correlation value for boys (r=.39) and the second highest for girls (r=.44).

Special Education Students Compared to Other Students. The children in Special Education Classes (N=10) compared to the remaining sample in the third grade (N=44) generally had less socially acceptable scores on both the positive and negative CBD behavior items when they were in Head Start, the differences between eight of the 11 items reaching statistical significance ($p<.01$ to <05), Table 15. The Special Education children also had scored significantly lower than the others on the Head Start PPT. Their PPT scores lagged approximately a year behind the others on the PPT normative tables, representing a sizeable difference in ability for children only four years old.

To briefly sum up the results of our predictive validity study, 54 Maryland children on whom CBD ratings had been obtained in Head Start were identified in the same Maryland school system near the close of the third grade. Of these children, 44 had test scores on the Cognitive Abilities Test and the Iowa Tests of Basic Skills, 10 having been excluded from the testing because they had been placed in Special Education classes. The CBD ratings were able to predict general performance levels for the CAT and ITBS test scores after a five year span of time. The CBD item Conforming & Obedient proved to be the best predictor of the third grade test scores. Most of the other CBD items reached statistical significance with the third grade test scores, with several environment-centered items, such as Conforming and Obedient, having a predictive advantage over some child-centered items, such as Self-Reliant and Self-Sufficient. Upon examining the data separately for girls and for boys, we found that girls' CBD ratings were much better predictors than boys' CBD ratings of later ability and performance scores. Not unexpectedly in our society, girls' CBD ratings were better predictors for verbal performance and boys' CBD ratings were better predictors for quantitative performance. The early CBD ratings demonstrated that the

children who were placed in Special Education classes had statistically less acceptable social skills in the early years and tested approximately a year behind the other four-year-olds on the PPT when in the Head Start program.

SUMMARY AND CONCLUSIONS

The CBD, an adjective checklist, has been used successfully by teachers to describe children's pro- and antisocial behaviors related to preschool classroom competence. The simple ten-item instrument may be functioning well because its development was based on results of extensive research conducted with more comprehensive classroom behavior inventories by Earl Schaefer and associates. Interest has increased in gathering information on personality characteristics which help to explain intellectual acceleration and deceleration (Anastasia, 1976, p331). There is a need to identify both pro- and antisocial behaviors which influence school competence in the early years to help develop early prescriptive programs. Reliability and validity studies, conducted on the CBD with preschool children and older mentally retarded students functioning at the preschool level, provide evidence to support its concurrent validity and, in one study, its predictive validity over a five year period. Measures used in conjunction with the CBD in these studies include the PPT, PPVT, Boehm Test of Basic Concepts, Bayley Test Behavior Items, and in the third grade follow-up study, the Cognitive Abilities Test and the Iowa Tests of Basic Skills.

Across our samples, pro-social behavior characteristics improved with age while anti-social ones diminished, no doubt due both to the children's added maturity and to their increased understanding of their teachers' expectations. The teachers, all female, rated girls as having more pro-social and less antisocial behaviors than boys. Whether these ratings can be attributed to teacher bias or represent true sex-related behavior differences

is not known. Examination of intercorrelations of the CBD items across samples of children in normal (regular) classrooms reveals a stronger interrelated cluster of prosocial items and a more weakly correlated cluster of anti-social items. Correlational patterns on a detailed item analysis supported the proposal that the CBD can serve as an indicator of classroom competence.

For teachers' ratings of the CBD in a school for mentally retarded students, ages 5 to 17, functioning at the preschool level, global patterns of item intercorrelations were similar to those of the normal children. However, some meaningful differences at a detailed level of analysis suggest that the CBD is sensitive to individual population differences.

Results of a third grade follow-up study of 54 children were impressive but contained some surprises. The children had been rated on the CBD and tested with the PPT and PPVT when in Head Start. The CBD ratings had many relatively strong significant correlations with later test scores on the Cognitive Abilities Test and the Iowa Tests of Basic Skills. However, unexpectedly, the item Conforming & Obedient proved to be the best predictor of the third grade CAT Verbal and the ITBS Vocabulary and Reading Comprehension scores and of most other subtest scores. Based on our data it would appear that future success in school is more strongly related to Obedience & Conforming to the environment than to more self-centered personality characteristics. Also of interest were the sex-linked aspects of prediction. Generally, the CBD ratings proved to be better predictors of CAT and ITBS scores for girls than for boys. For girls the CBD items yielded best predictions for verbal scores, but for boys the best predictions were for quantitative scores.

We compared the CBD behavior ratings of the children having third grade test scores with CBD ratings for 10 children not tested because they were assigned to Special Education classes. The Special Education children had significantly less socially acceptable scores than those in regular classes on both the positive and negative CBD items.

These data suggest that preschool CBD ratings can help identify children having problems in classroom competence, or the ability to function in a structured educational environment. Lack of classroom competence has a demonstratable effect on school achievement. As researchers are reporting successful methods to improve social skills in the classroom, the first step would be to identify the needs of particular children in this respect. Evidence presented here on the concurrent and predictive validity of the CBD suggest that teachers' preschool ratings of the CBD can help to identify those needs.

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TABLE 1

CLASSROOM BEHAVIOR DESCRIPTION
May Aaronson and Earl S. Schaefer

Child's Name_____ Birth Date_____

School_____ Class_____

Name of Rater (teacher)_____ Date Rated_____

Please describe the behavior of this child to the best of your ability from your own personal observation and experience without discussion with others. Circle the most appropriate number on each line. Do not omit any.

		Very Much Like	Some-what Like	Very Little Like	Not At All Like
1.	Is Considerate and Kind.	4	3	2	1
2.	Is Distractible and Hyperactive.	4	3	2	1
3.	Is Conforming and Obedient.	4	3	2	1
4.	Is Attentive and Persevering.	4	3	2	1
5.	Is Gregarious and Verbally Expressive.	4	3	2	1
6.	Is Belligerent and Irritable.	4	3	2	1
7.	Is Withdrawn and Solitary.	4	3	2	1
8.	Is Self-Reliant and Self-Sufficient.	4	3	2	1
9.	Is dependent, wants help constantly.	4	3	2	1
10.	Is able in comprehension and problem-solving	4	3	2	1

Circle the number which most nearly fits:

4 Well adjusted
3 Fairly well adjusted
2 Has some behavior difficulties
1 Has many behavior difficulties

TABLE 2
DESCRIPTION OF CLASSROOM BEHAVIOR DESCRIPTION SAMPLES

Samples (Racially Mixed)	Number of Subjects	Number of Raters	Area: Urban Suburban Rural	Age In Months	Auxiliary Data
1. Maryland Head Start	81	6	S & R	46-65	Preschool Preposition Test, Peabody Picture Vocabulary Test (N=5), Cognitive Abilities Test Iowa Tests of Basic Skills, Special Education Placement
2. Maryland Head Start Special Subgroup	37	3	S & R	46-57	Preschool Preposition Test, Peabody Picture Vocabulary Test, Cognitive Abilities Test, Iowa Tests of Basic Skills, Special Education Placement
3. North Carolina Day Care & Home	100	2	U & S	23-40	Preschool Preposition Test, Peabody Picture Vocabulary Test, Bayley Test Behavior Items
4. New York Right-to-Read Program	94	10	U	34-58	Preschool Preposition Test, Boehm Test of Basic Concepts
5. Utah (School for Mentally Retarded)	74	15	U	63-200	Preschool Preposition Test, Peabody Picture Vocabulary Test
Total Subjects	386*	36			

*Note: 360 of total Subjects had CBDs
471 = total CBDs obtained (Samples 2 & 5 had pre- and post-CBD ratings)

TABLE 3
MEANS FOR CBD ITEMS BY SIX-MONTH AGE GROUPS
ALL NORMAL SAMPLES COMBINED (N=280)

Age in Months	N	Well Adjusted	Able in Comprehension & Problem Solving	Attentive & Persevering	Self Reliant & S. Sufficient	Conforming & Obedient	Considerate & Kind	Gregarious & Verb. Expr.	Belligerent & Irritable	Withdrawn & Solitary	Dependent Wants Help Constantly	Distractible & Hyperactive
24-29	20	2.65	2.60	2.35	2.50	2.75	3.25	2.25	1.55	2.00	2.25	3.10
30-35	43	3.44	3.07	2.88	2.74	2.91	3.40	2.91	1.72	1.70	2.16	2.09
36-41	42	3.26	3.07	3.07	3.00	2.98	3.41	2.86	1.79	1.26	2.17	1.93
42-47	35	2.80	2.66	2.83	3.06	2.97	3.14	2.51	1.77	1.77	1.83	1.89
48-53	82	3.02	2.95	2.90	3.09	3.06	3.22	3.00	1.51	1.55	1.91	2.06
54-59	58	3.24	3.09	3.09	3.16	3.17	3.24	2.79	1.47	1.98	2.00	1.88
Overall Correlation with Age (Two-Tailed Test)		-.024 $p>.10$	.086 $p>.10$	.142 $p<.02$	.231 $p<.01$	.130 $p<.05$	-.160 $p<.01$	.112 $p<.10$	-.069 $p>.10$	-.020 $p>.10$	-.160 $p<.01$	-.190 $p<.01$

TABLE 4
SEX DIFFERENCES ON CBD ITEMS WITH AGE COVARIED
FOR NORMAL SAMPLES (N=286)

CBD ITEM	Girls N=147		Boys N=139		Significance level of difference*
	Mean	S.D.	Mean	S.D.	
Well Adjusted	3.23	.73	2.98	.86	.008
Able in Comprehension & Problem Solving	3.06	.69	2.84	.82	.012
Attentive & Persevering	3.09	.69	2.69	.84	.000
Self-Reliant & Self-Sufficient	3.09	.61	2.87	.75	.003
Conforming & Obedient	3.14	.74	2.85	.82	.002
Considerate & Kind	3.39	.64	3.14	.68	.002
Gregarious & Verbally Expressive	2.84	.81	2.78	.83	.545
Belligerent & Irritable	1.46	.72	1.79	.83	.001
Withdrawn & Solitary	1.75	.87	1.76	.78	.931
Dependent, Wants Help Constantly	1.95	.72	2.11	.82	.065
Distractible & Hyperactive	1.89	.96	2.29	1.01	.001

*(Two Tailed Test)

TABLE 5
REPLICATION OF FACTORS ANALYSES OF
CLASSROOM BEHAVIOR INVENTORIES AND CLASSROOM BEHAVIOR DESCRIPTION

Replicated Bipolar Factors	Classroom Behavior Inventories			Classroom Behavior Description				CBD Items
	Head Start[a] N=1579	Grades K-6[b] N=564	Grade 7[c] N=150	Head Start 46-65 Mos. N=118	Day Care/Home 23-40 Mos. N=85	Right-to Read 45-68 Mos. N=83	Retarded 5-17 Yrs. N=74	
Task Oriented	.91	.79	.80	.86	.55	.49	.66	Attentive & Persevering
Distractibility	-.51	-.76	---	-.76	-.70	-.87	-.56	Distractible & Hyperactive
Considerateness	.29	.72	---	.82	.52	.77	.83	Considerate & Kind
Hostility	-.92	-.82	-.89	-.79	-.86	-.60	-.74	Belligerent & Irritable
Extraversion	.91	.74	.80	.87	.68	.86	.89	Gregarious & Verbally Expressive
Introversion	-.82	-.76	-.80	-.78	-.48	-.50	-.66	Withdrawn & Solitary

[a]Schaefer-Aaronson Systems. In Boyer, Simon and Karafin, 1973, p 1798

[b]Schaefer, Earl S., 1975, p 10

[c]Schaefer, Aaronson & Burgoon, 1965

TABLE 6
CORRELATIONS OF CBD ITEMS WITH FOUR BAYLEY TEST BEHAVIOR ITEMS

Behavior	Goal Directedness	Attention Span	Object Orientation	Cooperativeness
Well Adjusted	.64	.54	.65	.47
Able in Comprehension and Prob'em Solving	.67	.61	.62	.41
Attentive & persevering	.75	.72	.69	.52
Self-Reliant & Self-Sufficient	.59	.56	.60	.43
Conforming & Obedient	.38	.32	.31	.37
Considerate & Kind	.44	.38	.39	.33
Gregarious and Verbally Expressive	.45	.45	.57	.54
Belligerent & Irritable	-.13	.06	.01	-.21*
Withdrawn & Solitary	-.24*	-.21*	-.34	-.34
Dependent, wants help constantly	-.44	-.37	-.45	-.30
Distractible & Hyperactive	-.78	-.74	-.65	-.64
Preschool Preposition Test	.77	.77	.66	.47

*p < .05 (two-tailed test) N=98
p < .005 underscored

TABLE 7
TEST - RETEST CORRELATIONS FOR CBD ITEMS
(Seven Months Interval)

CBD ITEM	Maryland Headstart Special Subgroup N=37	Mentally Retarded Sample Ages 5-17 N=73
Well Adjusted	.63	.33
Able in Comprehension and Problem Solving	.59	.52
Attentive and Persevering	.62	.46
Self Reliant and Self Sufficient	.51	.56
Conforming and Obedient	.50	.56
Considerate and Kind	.48	.56
Gregarious and Verbally Expressive	.55	.66
Belligerent and Irritable	.43	.65
Withdrawn and Solitary	.60	.71
Dependent, Wants Help Constantly	.52	.49
Distractible and Hyperactive	.57	.47
Preschool Preposition Test	.65	.64

For Underlined Values $p < .001$ (Two-Tailed Test)

TABLE 8
HOTELLING'S T^2 TEST FOR CBD AND PPT SCORES
ACROSS A SEVEN-MONTH INTERVAL

	Maryland Headstart Special Subgroup (N=37)				Mentally Retarded Sample (N=74)			
CBD ITEM	Pre-test Mean	Post-test Mean	Pre-test S.D.	Post-test S.D.	Pre-test Mean	Post-test Mean	Pre-test S.D.	Post-test S.D.
Well Adjusted	3.05	2.92	0.91	0.95	2.66	2.39	0.86	0.93
Able in Comprehension Problem Solving	3.27	3.32	0.73	0.85	2.38	2.23	0.92	0.84
Attentive and Persevering	3.22	3.11	0.71	0.77	2.49	2.46	0.94	0.92
Self Reliant and Self Sufficient	3.13	3.22	0.79	0.75	2.53	2.58	0.91	0.89
Conforming and Obedient	3.35	3.27	0.89	0.80	2.89	2.88	0.82	0.89
Considerate and Kind	3.40	3.40	0.64	0.69	3.20	3.22	0.83	0.80
Gregarious and Verbally Expressive	3.00	3.19	0.85	0.81	2.65	2.53	0.99	1.01
Belligerent and Irritable	1.46	1.68	0.73	0.85	1.88	2.16	0.88	1.01
Withdrawn and Solitary	1.70	1.65	0.81	0.82	1.72	1.80	0.79	0.89
Dependent, Wants Help Constantly	1.92	1.89	0.86	0.70	2.12	2.45	0.94	1.04
Distractible and Hyperactive	1.92	2.00	0.92	1.03	2.68	2.72	1.04	1.08
Preschool Preposition Test	15.30	17.78	3.77	3.38	14.32	15.03	5.15	4.81

For underlined values, differences are significant at the .05 level or better.

TABLE 9
CORRELATION MATRIX FOR CBD ITEMS
FOR NORMAL SAMPLES (N=286)

	1	2	3	4	5	6	7	8	9	10	11
Prosocial Items											
1. Well Adjusted											
2. Able in Comprehension and Problem Solving	.56										
3. Attentive and Persevering	.51	.60									
4. Self Reliant and Self Sufficient	.45	.55	.47								
5. Conforming and Obedient	.41	.29	.58	.24							
6. Considerate and Kind	.50	.36	.55	.24	.58						
7. Gregarious and Verbally Expressive	.39	.58	.29	.39	.06	.16					
Antisocial Items											
8. Belligerent and Irritable	-.43	-.25	-.41	-.19	-.51	-.47	-.13				
9. Withdrawn and Solitary	-.18	-.28	-.10	-.25	.04	.02	-.54	.14			
10. Dependent, Wants Help Constantly	-.38	-.45	-.39	-.64	-.24	-.19	-.31	.28	.25		
11. Distractible and Hyperactive	-.41	-.32	-.58	-.22	-.59	-.41	-.14	.47	.04	.20	
12. PPT	.25	.33	.28	.30	.13	.04	.28	-.03	-.07	-.19	-.24

. For Underlined Values $p < .01$ (Two Tailed Test)

TABLE 10
CORRELATION MATRIX FOR CBD ITEMS
FOR MENTALLY RETARDED SAMPLE (N=74)

	1	2	3	4	5	6	7	8	9	10	11
Prosocial Items											
1. Well Adjusted											
2. Able in Comprehension and Problem Solving	.37										
3. Attentive and Persevering	.68	.48									
4. Self Reliant and Self Sufficient	.42	.48	.58								
5. Conforming and Obedient	.66	.38	.55	.26							
6. Considerate and Kind	.54	.19	.40	.20	.62						
7. Gregarious and Verbally Expressive	-.13	.23	-.05	-.01	.05	.09					
Antisocial Items											
8. Belligerent and Irritable	-.67	-.11	-.46	-.26	-.48	-.46	.27				
9. Withdrawn and Solitary	-.20	-.10	-.13	-.08	-.05	-.02	-.38	.09			
10. Dependent, Wants Help Constantly	-.29	-.25	-.46	-.54	.07	.16	.15	.10	.09		
11. Distractible and Hyperactive	-.58	-.42	-.60	-.41	-.46	-.31	.25	.50	-.06	.37	
12. PPT	-.03	.40	.17	.14	.16	-.08	.20	.21	.08	-.20	-.14

For Underlined Values $p < .01$ (Two Tailed Test)

FIGURE 1

CORRELATIONS OF CBD ITEMS WITH 2 MENTAL TESTS
PPT
PPVT
N = 116
R(CBD, MENTAL TEST)
+.6
+.4
+.2
0
-.2
-.4
-.6
ABLE IN COMP.& P.S.
ATTENTIVE & PERSEVERING
SELF RELIANT & SELF SUFFICIENT
WELL ADJUSTED
CONSIDERATE & KIND
GREGARIOUS & VERBALLY EXPR.
CONFORMING & OBEDIENT
BELLIGERENT & IRRITABLE
WITHDRAWN & SOLITARY
DEPENDENT & WANTS HELP
DISTRACTIBLE & HYPERACTIVE

TABLE 11
CORRELATIONS OF CBD ITEMS WITH
PRESCHOOL PREPOSITION TEST AND PEABODY PICTURE
VOCABULARY TEST (N=116)

CBD ITEM	PPT	PPVT RAW SCORE
Well Adjusted	.41	.34
Able in Comprehension and Problem Solving	.57	.58
Attentive and Persevering	.55	.46
Self Reliant and Self Sufficient	.49	.51
Conforming and Obedient	.21	.16
Considerate and Kind	.36	.31
Gregarious and Verbally Expressive	.33	.41
Belligerent and Irritable	-.06	-.06
Withdrawn and Solitary	-.16	-.30
Dependent, Wants Help Constantly	-.32	-.30
Distractible and Hyperactive	-.47	-.42

For underlined values $p < .01$ (Two Tailed Test)

Table 12

CORRELATIONS OF PRESCHOOL CLASSROOM BEHAVIOR DESCRIPTION ITEMS AND COGNITIVE TEST SCORES WITH THIRD-GRADE COGNITIVE AND ACHIEVEMENT TEST SCORES

Third Grade Tests	N	Well Adjusted	Able	Attentive & Persevering	Self Reliant S. Sufficient	Conforming & Obedient	Considerate Kind	Gregarious & Verb. Expr.	Belligerent & Irritable	Withdrawn & Solitary	Dependent Wants Help Constantly	Distractible Hyperactive	PPT	PPVT IQ N=23
CAT - 3 Subtests														
I. Verbal	43	.35	.32	.44	.02	.47	.42	.25	-.33	-.08	-.01	-.25	.23	.17
II. Quant.	43	.28	.41	.30	.06	.29	.27	.29	-.28	-.09	-.04	-.18	.39	.32
III. N-Verbal	43	.21	.45	.07	.12	.12	.03	.40	-.02	-.23	-.11	.02	.39	.26
ITBS - 5 Subtests														
I. Vocabulary	44	.42	.31	.52	.14	.54	.48	.30	-.37	-.14	-.02	-.25	.29	.10
II. Reading Comprehen	44	.41	.31	.56	.18	.65	.55	.15	-.55	.07	.05	-.39	.27	-.15
III, Language Skills:														
Spelling	43	.32	.29	.35	.08	.39	.36	.30	-.31	-.23	.04	-.24	.23	.32
Capitalization	44	.36	.23	.47	.13	.46	.40	.17	-.35	-.14	.06	-.26	.17	.10
Punctuation	43	.30	.21	.37	.03	.37	.34	.18	-.23	-.12	.02	-.24	.18	.31
Usage	42	.43	.26	.48	.08	.53	.43	.20	-.49	-.09	-.03	-.33	.16	-.08
IV. Work-Study Skills														
Map Reading	40	.19	.35	.25	.13	.38	.33	.20	-.30	-.02	-.05	-.25	.32	.22
Graphs	41	.40	.38	.41	.06	.33	.53	.29	-.35	-.16	-.03	-.27	.37	.58**
Reference Use	40	.36	.44	.42	.24	.27	.33	.22	-.21	-.25	-.12	-.17	.30	.54*
V. Math. Skills														
Math. Concepts	43	.47	.26	.31	.05	.39	.30	.19	-.36	-.06	-.09	-.30	.38	.25
Problem Solving	43	.37	.24	.44	.14	.44	.38	.15	-.34	-.06	-.07	-.28	.25	.07
ITBS Composite Score (Sum of 5 Subtests)	40	.38	.44	.47	.19	.47	.47	.35	-.36	-.17	-.04	-.28	.41	.32

CAT - Cognitive Abilities Test; ITBS - Iowa Test of Basic Skills
PPT - Preschool Preposition Test; PPVT - Peabody Picture Vocabulary Test

Underscored Items:
$p < .05$ for values above .26
$p < .01$ for values above .37
$p < .005$ for values above .40

*$p < .01$
**$p < .005$

Table 13

GIRLS ONLY

CORRELATIONS OF PRESCHOOL CLASSROOM BEHAVIOR DESCRIPTION ITEMS AND COGNITIVE TEST SCORES WITH THIRD-GRADE COGNITIVE AND ACHIEVEMENT TEST SCORES

Third Grade Tests	N	Well Adjusted	Able	Attentive & Persevering	Self Reliant & S. Sufficient	Conforming & Obedient	Considerate & Kind	Gregarious & Verb. Expr.	Belligerent & Irritable	Withdrawn & Solitary	Dependent Wants Help Constantly	Distractible & Hyperactive	PPT	PPVT IQ N-9
CAT - 3 Subtests														
I. Verbal	25	.56	.52	.51	-.02	.54	.46	.44	-.47	-.17	-.20	-.33	.41	.19
II. Quant.	25	.34	.37	.39	-.12	.42	.44	.28	-.48	-.08	.01	-.25	.40	.41
III. Non-Verbal	25	.53	.56	.45	.14	.45	.44	.47	-.35	-.26	-.15	-.20	.45	.40
ITBS - 5 Subtests														
I. Vocabulary	25	.65	.53	.63	.26	.62	.51	.58	-.46	-.36	-.36	-.30	.51	.05
II. Reading Comprehen	25	.56	.50	.52	.36	.60	.48	.42	-.55	-.21	-.36	-.31	.48	.04
III. Language Skills:														
A. Spelling	25	.39	.36	.35	.12	.40	.46	.47	-.36	-.36	-.03	-.17	.26	.45
B. Capitalization	25	.52	.24	.45	.13	.39	.48	.39	-.38	-.36	-.09	-.25	.33	.31
C. Punctuation	25	.52	.35	.42	.15	.40	.38	.41	-.28	-.33	-.14	-.22	.29	.41
D. Usage	24	.59	.31	.45	.08	.51	.38	.43	-.52	-.35	-.37	-.31	.23	-.05
IV. Work-Study Skills														
A. Map Reading	23	.30	.36	.22	.13	.49	.45	.19	-.53	.01	-.20	-.51	.46	.39
B. Graphs	23	.42	.43	.33	.00	.44	.53	.39	-.34	-.15	-.02	-.21	.47	.70
C. Reference Use	23	.45	.50	.40	.17	.33	.40	.47	-.22	-.45	-.28	-.16	.38	.71
V. Math. Skills														
A. Math Concepts	24	.47	.29	.29	.09	.46	.40	.27	-.39	-.14	-.12	-.31	.33	.43
B. Problem Solving	24	.50	.40	.36	.20	.47	.41	.33	-.39	-.28	-.20	-.11	.32	.18
ITBS Composite Score (Sum of 5 Subtests)	23	.55	.51	.51	.21	.53	.62	.56	-.44	-.34	-.24	-.34	.51	.66

CAT - Cognitive Abilities Test; ITBS - Iowa Test of Basic Skills
PPT - Preschool Preposition Test; PPVT - Peabody Picture Vocabulary Test
Underscored Items: $p < .05$

Table 14

BOYS ONLY
CORRELATIONS OF PRESCHOOL CLASSROOM BEHAVIOR DESCRIPTION ITEMS AND COGNITIVE TEST SCORES WITH THIRD-GRADE COGNITIVE AND ACHIEVEMENT TEST SCORES

Third Grade Tests	N	Well Adjusted	Able	Attentive & Persevering	Self Reliant & S. Sufficient	Conforming & Obedient	Considerate & Kind	Gregarious & Verb. Expr.	Belligerent & Irritable	Withdrawn & Solitary	Dependent Wants Help Constantly	Distractible & Hyperactive	PPT	PPVT IQ N=11
CAT - 3 Subtests														
I. Verbal	18	.13	.06	.34	.18	.37	.34	.20	-.15	-.10	-.04	-.13	-.14	-.01
II. Quant.	18	.21	.54	.20	.45	.09	.04	.43	.00	-.18	-.25	-.08	.36	.12
III. Non-Verbal	18	-.16	.33	-.28	.13	-.27	-.37	.40	.32	-.27	-.19	.27	.31	.02
ITBS - 5 Subtests														
I. Vocabulary	19	.25	.03	.41	.03	.42	.42	.12	-.28	.04	.11	-.18	-.09	.07
II. Reading Comprehen	19	.44	.18	.59	.07	.75	.60	.08	-.61	.29	.16	-.52	.00	-.68
III. Language Skills:														
A. Spelling	18	.42	.32	.37	.15	.39	.21	.33	-.28	-.25	-.29	-.39	.21	.01
B. Capitalization	19	.31	.33	.46	.23	.50	.26	.13	-.33	-.03	-.09	-.26	-.06	-.25
C. Punctuation	18	.02	.01	.29	-.09	.28	.25	.01	-.12	.12	-.02	-.26	-.06	.13
D. Usage	18	.36	.31	.51	.17	.58	.46	.10	-.47	.18	.04	-.37	.00	-.37
IV. Work-Study Skills														
A. Map Reading	17	.11	.38	.24	.16	.24	.17	.31	-.05	-.14	-.05	.03	.10	.11
B. Graphs	18	.45	.39	.45	.21	.17	.52	.38	-.34	-.34	-.31	-.34	.20	.50
C. Reference Use	17	.41	.49	.44	.46	.10	.20	.12	-.17	-.12	-.32	-.20	.17	.59
V. Math. Skills														
A. Math Concepts	19	.50	.23	.36	.01	.23	.22	.09	-.34	-.07	-.10	-.30	.47	.10
B. Problem Solving	19	.28	.10	.47	.11	.41	.33	.06	-.29	.12	-.08	-.39	.19	-.05
ITBS Composite Score (Sum of 5 Subtests)	17	.31	.45	.41	.27	.37	.28	.34	-.26	-.07	-.16	-.25	.23	-.07

CAT - Cognitive Abilities Test; ITBS - Iowa Test of Basic Skills
PPT - Preschool Preposition Test; PPVT - Peabody Picture Vocabulary Test

Underscored Items: $p < .05$

TABLE 15

HOTELLING'S T^2 TEST ON THIRD GRADE FOLLOW-UP OF MARYLAND SAMPLE SPECIAL EDUCATION STUDENTS COMPARED TO OTHER STUDENTS ON HEADSTART CBD RATINGS

CBD ITEM	Special Ed. (N=10) Mean	S.D.	Non-Special Ed. (N=44) Mean	S.D.	Level of Significance (Two-Tailed Test)
Well-Adjusted	1.9	.57	3.3	.83	$<.01$
Able in Comprehension and Problem Solving	2.4	.84	3.3	.62	$<.01$
Attentive and Persevering	2.3	.82	3.2	.74	$<.01$
Self-Reliant and Self-Sufficient	2.4	.84	3.3	.67	$<.01$
Conforming and Obedient	2.7	.67	3.4	.84	$<.02$
Considerate and Kind	2.9	.57	3.4	.79	$<.05$
Gregarious and Verbally Expressive	2.6	.84	3.0	.79	$>.10$
Belligerent and Irritable	1.9	1.20	1.6	.90	$>.10$
Withdrawn and Solitary	1.4	.97	1.8	.81	$>.10$
Dependent, Wants Help Constantly	2.5	.71	1.8	.69	$<.01$
Distractible and Hyperactive	2.6	1.17	1.8	.95	$<.05$
Preschool Preposition Test	11.20	4.58	15.91	3.82	$<.01$